

We claim:

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1. An isolated nucleic acid molecule comprising a member of the group consisting of:
- (a) a nucleotide sequence that encodes a polypeptide having the amino acid sequence of FIG. 2;
 - (b) the complement of the nucleotide sequence of (a);
 - (c) a HBMYCNG gene or a complement of a HBMYCNG gene as contained in ATCC Deposit No. _____;
 - (d) an isolated nucleic acid molecule comprising nucleotides 23 to 2011 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide of SEQ ID NO:2 minus the start codon;
 - (e) an isolated nucleic acid molecule comprising nucleotides 20 to 2011 of SEQ ID NO:1, wherein said nucleotides encode a polypeptide of SEQ ID NO:2 including the start codon;
 - (f) An isolated nucleic acid molecule comprising the nucleotide sequence of FIG. 1;
 - (g) A nucleic acid molecule comprising a nucleotide sequence encoding a deletion mutant of HBMYCNG or the complement of the nucleotide sequence of the deletion mutant of HBMYCNG;
 - (h) a nucleic acid molecule capable of hybridizing to and which is at least 95% identical to a nucleic acid molecule of (a), (b), (c), (d), (e), (f), or (g); and

- 5 (i) An isolated nucleic acid molecule of (h),
further comprising a label.

2. An isolated nucleic acid molecule comprising a nucleotide sequence that hybridizes to the nucleic acid of claim 1 and encodes a naturally occurring HBMYCNG 10 polypeptide.

3. An isolated nucleic acid molecule of claim 2 further comprising the nucleotide sequence linked uninterrupted by stop codons to a nucleotide sequence 15 that encodes a heterologous protein or peptide.

4. A recombinant vector containing the nucleotide sequence of claim 1.

20 5. A genetically engineered host cell containing
the nucleotide sequence of claim 1.

6. The genetically engineered host cell of claim 5
containing the nucleotide sequence of claim 1 operatively
25 associated with a regulatory nucleotide sequence
containing transcriptional and translational regulatory
information that controls expression of the nucleotide
sequence in a host cell.

30 7. A method of making an HBMYCNG polypeptide comprising the steps of:

8. The method of claim 7, wherein the HBMYCNG
5 polypeptide is HBMYCNG or a functionally equivalent
derivative thereof.

9. An antibody preparation which is specifically
reactive with an epitope of an HBMYCNG polypeptide.

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10. A transgenic animal comprising the nucleic acid
molecule of claim 1.

11. A substantially pure polypeptide comprising a
15 member of the group selected from:

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- (a) A substantially pure polypeptide encoded
by the nucleic acid molecule of claim 1;
- (b) A substantially pure human polypeptide, as
depicted in FIG. 2;
- (c) A substantially pure polypeptide which is
at least 95% identical to the polypeptide
as set forth in FIG. 2;
- (d) A substantially pure polypeptide
comprising amino acids 2 to 664 of SEQ ID
25 NO:2, wherein said amino acids 2 to 664
comprise a polypeptide of SEQ ID NO:2
minus the start methionine; and
- (e) A substantially pure polypeptide
comprising amino acids 1 to 664 of SEQ ID
30 NO:2.

12. A fusion protein comprising a polypeptide of
claim 11 and a second heterologous polypeptide.

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13. A test kit for detecting and/or quantitating a
wild type or mutant HBMYCNG nucleic acid molecule in a
sample, comprising the steps of contacting the sample

with a nucleic acid molecule of claim 1; and detecting
5 and/or quantitating the label as an indication of the
presence or absence and/or amount of a wild type or
mutant HBMYCNG nucleic acid.

14. A test kit for detecting and/or quantitating a
10 wild type or mutant HBMYCNG polypeptide in a sample,
comprising the steps of contacting the sample with the
antibody of claim 9; and detecting and/or quantitating a
polypeptide-antibody complex as an indication of the
presence or absence and/or amount of a wild type or
15 mutant HBMYCNG nucleic acid.

15. A method for identifying compounds that
modulate HBMYCNG activity comprising:

- (a) contacting a test compound to a cell that
20 expresses a HBMYCNG gene;
- (b) measuring the level of HBMYCNG gene
expression in the cell; and
- (c) comparing the level obtained in (b) with
the HBMYCNG gene expression obtained in
25 the absence of the compound;

such that if the level obtained in (b) differs from that
obtained in the absence of the compound, a compound that
modulates HBMYCNG activity is identified.

30 16. A method for identifying compounds that
modulate HBMYCNG activity comprising:

- (a) contacting a test compound to a cell that
contains a HBMYCNG polypeptide;
- (b) measuring the level of HBMYCNG polypeptide
35 or activity in the cell; and
- (c) comparing the level obtained in (b) with
the level of HBMYCNG polypeptide or

activity obtained in the absence of the
5 compound;

such that if the level obtained in (b) differs from that obtained in the absence of the compound, a compound that modulates HBMYCNG activity is identified.

10 17. A method for identifying compounds that regulate ion channel-related disorders, comprising:

- (a) contacting a test compound with a cell which expresses a nucleic acid of claim 1, and
- 15 (b) determining whether the test compound modulates HBMYCNG activity.

18. A method for the treatment of ion channel-related disorders, comprising administering an effective amount of a compound that increases expression 20 of a HBMYCNG gene.

19. A pharmaceutical formulation for the treatment of ion channel-related disorders, comprising a compound 25 that activates or inhibits HBMYCNG activity, mixed with a pharmaceutically acceptable carrier.

20. A method for identifying compounds that modulate the activity of an ion channel comprising:

- 30 (a) contacting a test compound to a cell that expresses a HBMYCNG gene and the ion channel, and measuring Ca⁺² flux into the cell;
- (b) contacting a test compound to a cell that expresses a HBMYCNG gene but does not express the ion channel, and measuring Ca⁺² flux into the cell; and

- (c) comparing Ca+2 flux obtained in (b) with
5 the Ca+2 flux obtained in (a);
such that if the level obtained in (b) differs from that
obtained in (b), a compound that modulates ion channel
activity is identified.
- 10 21. An isolated nucleic acid molecule consisting of
a member of the group consisting of:
- (a) a nucleotide sequence that encodes a
polypeptide having the amino acid sequence
of FIG. 2;
- 15 (b) the complement of the nucleotide sequence
of (a);
- (c) a HBMYCNG gene or a complement of a
HBMYCNG gene as contained in ATCC Deposit
No. _____;
- 20 (d) an isolated nucleic acid molecule
comprising nucleotides 23 to 2011 of SEQ
ID NO:1, wherein said nucleotides encode a
polypeptide of SEQ ID NO:2 minus the start
codon;
- 25 (e) an isolated nucleic acid molecule
comprising nucleotides 20 to 2011 of SEQ
ID NO:1, wherein said nucleotides encode a
polypeptide of SEQ ID NO:2 including the
start codon;
- 30 (f) An isolated nucleic acid molecule
comprising the nucleotide sequence of FIG.
1;
- (g) A nucleic acid molecule comprising a
nucleotide sequence encoding a deletion
35 mutant of HBMYCNG or the complement of the
nucleotide sequence of the deletion mutant
of HBMYCNG;

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